



NFPA DESIGNATION 704

## MATERIAL SAFETY DATA SHEET

HAZARD RATING	- HEALTH	1
4=Extreme		
3=High	- FIRE	0
2=Moderate		
1=Slight	- REACTIVITY	0
0=Insignificant		
	- SPECIFIC HAZARD	NONE

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 TITLE: Manager, Materials R/D  
 DATE: August 15, 198

TRADE NAME, COMMON NAME OR SPECIFICATION: Diamond Plated Guide Shoe with D or DX suffix (Example VB-BD or UA-B-752DX).  
 Single Stroke Honing Unit (Example A14A-437S) or Diamond Valve Seating Wheel (Example VS-2250-45-D5) or Diamond Honing Tool (Example VG-344-D5) or Super Mandrel with D or DX suffix (Example K6-185CSD or K6-189CSDX) or Diamond Dresser MAN-700.  
 CHEMICAL FAMILY: METAL ALLOY. CLASSIFICATION: Machine, Machine Parts. D.O.T. SHIPPING CLASS: Class 85

## SECTION 2 HAZARDOUS INGREDIENTS/IDENTITY (PER 29 C.F.R. 1910.1200(g))

COMMON NAME	CHEMICAL NAME OF COMPONENTS	CAS NO	OSHA PEL mg./cu. m.	ACGIH TLV-TWA mg./cu. m.	CARCINOGENIC
IRON	IRON	7439-89-6	10 as Iron Oxide fume	5.0 as Iron Oxide fume	N
NICKEL	NICKEL	7440-02-0	1.0	1.0	Y
DIAMOND	CARBON	7440-44-0	3.5 as Carbon Black	3.5 as Carbon Black	N
CBN	CUBIC BORON NITRIDE	NAIF	NAIF	NAIF	N
COBALT	COBALT	7440-48-4	0.1	.05	N (1)
PHOSPHOROUS	PHOSPHOROUS	7723-14-0	0.1	0.1	N
SULFUR	SULFUR	7704-34-9	13 as Sulfur Dioxide	5.0 as Sulfur Dioxide	N
COPPER	COPPER	7440-50-8	1.0 / 0.1 fume	1.0 / 0.2 fume	N
TIN	TIN	7440-31-5	2.0	2.0 / 2.0 fume	N
MANGANESE	MANGANESE	7439-96-5	5.0	5.0 / 1.0 fume	N
ALUMINUM	ALUMINUM	7429-90-5	NONE	10	N
SILICON	SILICON	7440-21-3	NONE	5 as respirable dust	N
ZINC	ZINC	7440-66-6	5.0 as Zinc Oxide fume	5.0 as Zinc Oxide fume	N
CHROMIUM	CHROMIUM	7440-47-3	1.0	0.5	N (1)

(1) CERTAIN COMPOUNDS OF COBALT AND CHROMIUM HAVE BEEN IDENTIFIED AS SUSPECT HUMAN CARCINOGENS BY I.A.R.C., N.T.P. ANNUAL REPORT.  
 NAIF= No applicable information found.  
 FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS, INDUSTRIAL SALES DEPARTMENT.

## SECTION 3 PHYSICAL &amp; CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)-----7.0 (APPROX)  
 PERCENT VOLATILE BY WEIGHT-----NOT VOLATILE  
 VAPOR DENSITY (AIR=1)-----NOT VOLATILE  
 SOLUBILITY IN WATER-----NOT SOLUBLE  
 APPEARANCE AND ODOR-----SOLID METAL OBJECT

MELTING POINT-----1700 F  
 VAPOR PRESSURE (mm Hg)-----NOT VOLATILE  
 EVAPORATION RATE-----NOT VOLATILE  
 REACTIVITY IN WATER-----NOT REACTIVE

## SECTION 4 SPECIAL PRECAUTIONS HANDLING AND STORAGE: NONE Refer to Section 7.

SECTION 5 CORROSIVITY AND REACTIVITY DATA STABILITY: Material is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Concentrated acids such as nitric or hydrochloric. HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen gas. Toxic gases and vapors (such as nickel carbonyl and oxides of nitrogen) may be released in a fire involving nickel or in a decomposition of nickel compounds.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE  
 OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUMES WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES. Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever (flu-like symptoms). Symptoms may be aggravated for sensitive individuals with respiratory conditions (such as emphysema). Persons with light skin, sensitive skin or large amounts of body hair may experience skin disorders from contact with metal fines.

ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF=NO APPLICABLE INFORMATION FOUND, SKIN=SKIN ABSORPTION, EYE=EYE CONTACT, INHAL=INHALATION, INGEST=INGESTION

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

CARBON: ACUTE: SKIN: May cause irritation. EYE: May cause irritation and swelling. INHAL: May cause irritation to the nose or throat (Bronchitis). INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: As graphite. May produce a progressive and disabling lung disease. Symptoms include headache, coughing, depression, decreased appetite, difficult breathing and the production of black sputum. Individuals may be free of symptoms for many years and then suddenly become disabled. INGEST: NAIF.

CHROMIUM: ACUTE: SKIN: Chromium compounds may cause dermatitis. EYE: May cause irritation. INHAL: Dusts of the metal may cause coughing and wheezing, headache, difficult breathing, fever and loss of weight. INGEST: Literature reports the oral toxicity as LD Lo=71 mg/kg (Hamsters). CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: There are reports of a nodular type of breathing disease with impairment of lung function. Some insoluble chromium compounds are suspected carcinogens. INGEST: NAIF.

COBALT: ACUTE: SKIN: Cobalt can cause an allergy. Literature reports very small quantities have caused allergic sensitivity type dermatitis. Eruptions are usually located in the flexure creases of the elbow, knee, ankles, and neck. Cross sensitization can occur between cobalt and nickel and cobalt and chromium. EYE: May cause irritation. INHAL: Cobalt dust inhalation may cause an asthma-like disease characterized by coughing and difficult breathing. INGEST: Literature reports the oral toxicity to be LD Lo=1500 mg/kg (rats). Ingesting cobalt dust can cause vomiting and diarrhea. A sensation of hotness may occur after ingestion of excessive amounts. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Inflammation of the lungs that may be reversible and abnormal tissue growth. INGEST: NAIF.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

IRON: ACUTE: SKIN: NAIF. EYE: Dust may irritate eyes. INHAL: NAIF. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: The inhalation of iron oxide fumes or dust may cause an apparent benign lung disease which is called siderosis. This disease is reported not to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible. INGEST: NAIF.

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

NICKEL: ACUTE: SKIN: NAIF. EYE: Causes eye irritation. INHAL: Nickel is an irritant to the mucous membrane of the upper respiratory tract. INGEST: Literature reports nickel soluble salts are quite toxic and if swallowed may cause giddiness and nausea. CHRONIC: SKIN: Skin sensitization resulting in chronic eczema "Nickel itch". EYE: NAIF. INHAL: Elemental nickel (as deposited from inhalation of nickel carbonyl) and nickel salts may cause cancer (producing an increased incidence of cancer of the lung and nasal passages). Effects on the heart muscle, brain, liver, and kidney have been seen in animal studies. INGEST: NAIF.

**PHOSPHOROUS:** ACUTE: SKIN: May result in severe burns. EYE: May cause severe irritation or burns. INHAL: Shock may ensue rapidly. INGEST: Literature reports the oral toxicity as LD 50=3030 u gm/kg. Shock may ensue rapidly. CHRONIC: SKIN: Systemic poisoning may follow skin burns. Can cause death of tissue of the jaw. EYE: NAIF. INHAL/INGEST: Systemic poisoning. Can affect the function or cause failure of the liver, kidney, heart or blood vessels.

**SILICON:** ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHAL: Dust may cause physical damage to the mucous membranes or nasal passages. INGEST: NAIF CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

**SULFUR:** ACUTE: SKIN: NAIF. EYE: May irritate the eyes. INHAL: May cause excessive tissue fluid in the lungs. Gaseous sulfur dioxide is irritating to mucous membranes of the upper respiratory tract. INGEST: Not toxic. Used in medicine as a laxative. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Chronic exposure may result in inflammation of the nose, fatigue, altered sense of smell, and chronic bronchitis. Symptoms are shortness of breath, cough, and increased mucous excretion. Animal experimentation has indicated that sulfur dioxide may be a possible co-carcinogenic agent. INGEST: NAIF.

**TIN:** ACUTE: SKIN: May cause skin irritation. EYE: May irritate eyes. INHAL: May irritate the mucous membranes. INGEST: Literature reports the toxicity is low. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Exposure to the dust or fumes of tin oxide can result in a benign lung disease called stannosis. No tissue reaction or breathing disorder has been associated with this lung condition. INGEST: NAIF.

**ZINC:** ACUTE: SKIN: Zinc oxide may produce a dermatitis called "oxide pox" due primarily to clogging of the sweat glands. EYE: NAIF. INHAL: Can cause flu like symptoms beginning four to twelve hours after exposure. Causes sweet or metallic taste in the mouth, dryness and irritation of the throat. Fever and shaking chills then develop. Symptoms last 24 to 48 hours. INGEST: NAIF. CHRONIC SKIN: NAIF. EYE: NAIF. INHAL: NAIF. INGEST: NAIF.

#### EMERGENCY FIRST AID

**INHALATION:** Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Seek medical attention.

**EYE CONTACT:** Remove contact lenses (if wearing) and flush eyes with water to remove particulates. Seek medical

attention to check for possible irritation. **SKIN CONTACT:** Brush off excess dust. Wash hands with mild non-abrasive soap and water. **INGESTION:** Seek medical attention.

**SECTION 7 HANDLING, STORAGE AND USE PROCEDURES** NORMAL STORAGE AND HANDLING: No special procedures required. NORMAL USE: No special procedures required. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Treat chips or dust as metal alloys. WASTE DISPOSAL METHODS: Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances.

**SECTION 8 PERSONAL PROTECTION INFORMATION** RESPIRATORY PROTECTION: If conditions of use (Dry Honing, cutting, or grinding) give rise to dust use NIOSH approved respirator rated for metal dust to maintain levels of dust well below ACGIH TLV and OSHA PEL/TLV levels. VENTILATION: If conditions of use (Dry Honing, cutting, grinding, welding, brazing or soldering) give rise to metal fumes use forced ventilation to maintain levels of fumes below ACGIH TLV and OSHA PEL/TLV levels. SKIN PROTECTION: Not required. EYE PROTECTION: Always wear NIOSH approved safety glasses when honing or operating machinery. OTHER EQUIPMENT: No applicable information found. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources to prevent a fire hazard.

**SECTION 9 FIRE AND EXPLOSION HAZARD DATA:** Material in the solid state does not present a fire or explosion hazard. Dust hazards exist under favoring conditions of small particulate size. Dispersion in air and strong ignition source may result in an explosion.

#### NOTICE

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